

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

CASE 13-E-0199 - In the Matter of Electric Vehicle Policies

Comments of the
Natural Resources Defense Council

and

Pace Energy and Climate Center

Luke Tonachel and
Max Baumhefner
Natural Resources Defense Council
40 West 20th Street
New York, New York 10011

Jackson Morris
Pace Energy and Climate Center
Pace Law School
744 Broadway
Albany, New York 12207

July 8, 2013

TABLE OF CONTENTS

I.	Introduction	1
II.	Responses to Commission Questions.....	3
	Jurisdiction Over Charging Stations:	3
	Utilities as Owners or Operators of Charging Stations:	6
	Impact of PEV Charging on Electric Infrastructure	7
	Utility Metering and Rate Issues	14
	Consumer Issues.....	18
	Facilitating the Integration of Variable Renewable Resources	23
III.	Conclusion.....	23

I. Introduction

The Natural Resources Defense Council (“NRDC”) and Pace Energy and Climate Center (“Pace”) commend the New York Public Service Commission (“Commission” or “PSC”) for opening Case 13-E-0199 and respectfully submit the following comments, including on behalf of NRDC’s more than 120,000 members residing in New York. The issues raised in the Commission’s “Notice” are critical to accelerating the deployment of plug-in electric vehicles (“PEVs” or “electric vehicles”) to meet the goals articulated in Governor Cuomo’s state-of-the-state address.¹ In order to capture the full environmental, social, and economic potential of vehicle electrification, while minimizing associated costs, NRDC and Pace recommend the Commission adopt three over-arching policy goals:

1. Reduce Barriers for Consumers to Own and Operate Plug-In Electric Vehicles

New York has the potential to be a national leader in vehicle electrification, with a large population of prospective early adopters. However, to-date, New York electric vehicle sales are a distant second to California’s (which accounts for roughly a third of sales nationally)² and the New York market remains relatively untapped. The Commission has the power to remove significant barriers to consumer adoption and improve the fundamental economics of vehicle electrification by maximizing fuel cost savings relative to gasoline and diesel.

¹ Governor Andrew M. Cuomo, *NY Rising*, 2013 State of the State.

² See California Plug-in Electric Vehicle Collaborative, *PEV Sales Dashboard*.
http://www.pevcollaborative.org/sites/all/themes/pev/files/5%20May_2013_Dashboard_PEV_Sales_130607.pdf

2. Minimize Costs and Impacts Associated with Electrification

Ensuring that utilities, charging service providers, and customers have the tools to manage PEV load in an efficient, reliable, and environmentally preferable manner will be critical. Utilities need to be notified as to the location of new PEV load to facilitate service planning and allow for targeted customer education and outreach. The Commission should consider policies that encourage utilities, Energy Service Companies (“ESCOs”), and third-party charging service providers to deploy pricing, equipment, and services that support load management. These policies should include transparent price signals to all PEV customers that smooth out the load curve, smart charging initiatives, and demand response programs.³

3. Maximize the Environmental, Utility Customer, and System Benefits of Plug-In Electric Vehicles

Plug-in vehicles can reduce greenhouse gas emissions and improve air quality, reduce dependence on oil, and on fuels in general, as customers benefit from the efficiency inherent in electric drive vehicles. Vehicle electrification also promises to improve the utilization of existing utility assets and provide grid support services that facilitate the integration of variable generation from renewable resources. The Commission should establish policy objectives that seek to maximize and effectively integrate each of these potential benefits.

³ Rate cases are one forum under the Commission’s jurisdiction in which this particular objective could be advanced. To this end, NRDC has intervened and provided expert testimony in the ongoing Con Ed rate case: *See* Natural Resources Defense Council, *Direct Testimony of Luke Tonachel on behalf of the Natural Resources Defense Council*, CASE 13-E-0030 - Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service, <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={326F56AA-BDE2-4278-9D8A-6822643567A4}>.

II. Responses to Commission Questions

With the goals enumerated above in mind, NRDC and Pace offer the following responses to the questions posed in the Commission's notice for Case 13-E-0199.

Jurisdiction Over Charging Stations:

- 1. To what extent and in what ways would the development of consumer acceptance and use of electric vehicles and of the supporting services for electric vehicles be affected by the Commission's determination that it does or does not have direct jurisdiction over publicly available Charging Stations, their operators or the transaction between publicly available Charging Station operators and members of the public?*

Companies providing electric vehicle charging services acting as customers of utilities or ESCOs should not be regulated as if they were utilities or ESCOs solely because they provide electricity to charge vehicles. While the broad language contained in New York Public Service Law can be read to confer jurisdiction over charging service companies, such a reading fails to account for the fact there is not likely to be a natural monopoly for such services. Asserting jurisdiction in such a manner would be detrimental to the development of a nascent and competitive market. A clear statement by the Commission may be necessary to provide regulatory certainty. However, any pronouncement, regulatory or legislative, meant to exempt electric vehicle charging companies acting as customers of utilities or ESCOs from regulation as such can and should be narrowly tailored to ensure it does not limit the Commission's ability to meet its core obligations.

The Commission should take care to maintain its ability to respond to a market that is likely to evolve in ways that cannot be anticipated. The Commission should likewise consider that the simple gas station analogy does not function well in this instance. Unlike gasoline or natural gas, electricity cannot be easily stored and fluctuation in demand instantly impacts the transmission and distribution system. In

addition, companies operating gas stations do not also offer refueling services in their customers' homes, as many electric vehicle charging companies hope to do.

NRDC and Pace oppose the prescriptive approach taken by the State of Washington House Bill 1571 (2011), which states: "The commission shall not regulate the rates, services, facilities, and practices of an entity that offers battery charging facilities to the public for hire..."⁴ At this nascent stage in the development of the charging services market, it is imprudent to tie the hands of future regulators. Rather, any exemption, regulatory or legislative, should simply state that charging electric vehicles does not alone render an entity subject to regulation as a utility or ESCO. NRDC and Pace recommend the following language:

A person or corporation owning, leasing, or operating a facility that supplies electricity to the public only to charge plug-in electric vehicles is not subject to regulation as an electric corporation or Energy Service Company solely because of that ownership, lease, or operation.

In determining the appropriate regulatory framework, the Commission and the legislature should differentiate between charging service companies that wish to procure at wholesale and those that simply wish to act as customers of utilities or ESCOs and make it plain that electricity procured at wholesale for PEV charging will be subject to the same requirements and regulations as electricity procured for any other purpose. The California Public Utilities Commission made this clear in the first phase of its rule-making on electric vehicles, concluding as a matter of law:

⁴ <http://apps.leg.wa.gov/documents/billdocs/2011-12/Pdf/Bills/Session%20Laws/House/1571-S.SL.pdf>

*If a provider of electric vehicle charging services procures electricity on the wholesale market the Commission has jurisdiction to enforce procurement requirements and other laws and rules that apply to direct transactions...*⁵

2. *In determining whether the provisions of the Public Service Law provide it with jurisdiction, should the Commission consider the manner in which a customer is billed for electric vehicle charging services, e.g., per kWh, per hour, day, month, etc?*

No, the Commission should not consider the manner in which a customer is billed. The Commission's authority under New York Public Service Law does not rest upon whether a quantity of energy or time is in the denominator of the commodity provided. Drawing jurisdictional boundaries based on revenue streams or billing methods could also have unintended consequences and distort the market, leading companies to hide the cost of energy in bundled services to avoid direct regulation by the Commission. Companies should be encouraged to bill volumetrically for electricity provided to encourage energy efficiency and make cost savings relative to conventional fuels transparent. The price of electricity as a transportation fuel should be as plain as the price of gas at the pump.

3. *If the commenter argues that the Commission should assert jurisdiction over publicly available Charging Stations and their operators, how should the Commission exercise that jurisdiction? For example, should public Charging Stations and their operators be subject to rate regulation?*

As noted above, an electric vehicle charging service company acting as a customer of a utility or ESCOs should not be subject to regulation as a utility or ESCO, including rate regulation, however, the Commission should also make it clear it retains other sources of authority to ensure the benefits of vehicle electrification are realized in the most cost-effective manner possible. Making the retention of alternative sources of

⁵ California Public Utilities Commission, *Decision 10-07-044*, July 29, 2010, Conclusions of Law 5.

authority explicit will quell concerns that the electric vehicle charging could undermine the integrity of the electrical grid. Specifically, the Commission should make it clear it retains authority over the terms of service, tariffs, and rates on which charging companies receive service from electric utilities and its authority over the practices of ESCOs. As stated in the notice for Case 13-D-0199: “Whether or not the Commission has jurisdiction over Charging Stations, the Commission does have jurisdiction over the sale of electric delivery service or commodity to Charging Stations by the distribution utilities operating in the State.” Likewise the Commission should make it plain that any exemption for companies acting as customers of utilities or ESCOs does not affect the Commission’s general authority and obligation to maintain the integrity of the electrical grid, under sections 65, 66, and 71 of New York Public Service Law, Article 4.

Utilities as Owners or Operators of Charging Stations:

4. *Should the Commission allow electric distribution utilities operating in New York State to own or operate Charging Stations:*
 - a) *as part of their regulated operations?*

Utility operation of charging stations as part of a regulated service could discourage other competitive market entrants. However, if the Commission acts to restrict utility ownership or operation of public charging stations as part of regulated operations, it should be careful to not preclude utility ownership of charging stations used for that utility company’s fleet, or prevent utilities from pursuing innovative programs (e.g., battery second life, vehicle-to-grid, etc.) that could return value to PEV customers. Likewise, the Commission may wish to allow regulated utilities to offer charging services in underserved markets. In sum, the Commission should avoid sweeping restrictions at this early stage in the development of the market.

b) segregated from their regulated operations, treating Charging Station assets as nonutility property and revenues and expenses related to Charging Station operations as revenues and expenses from nonutility operations?

The Commission should consider allowing utility ownership of public charging stations if such segregation from regulation operations would prevent regulated utilities from gaining an unfair competitive advantage over other market players, .

5. *Should unregulated affiliates of electric distribution utilities operating in New York State own or operate Charging Stations?*

Unregulated affiliates of electric distribution utilities should not be restricted from providing public charging services.

Impact of PEV Charging on Electric Infrastructure

6. *State-wide, the number of PEVs has increased from 962 in May 2012 to 3,931 in April 2013. Based on Department of Motor Vehicle Records, the concentration of PEVs by zip code can be ascertained.*

a) What steps can be taken to ensure that utilities are aware of new EVCE locations so they can proactively address any necessary distribution facility upgrades?

As noted in a comprehensive report on utility notification conducted jointly by Pacific Gas & Electric, San Diego Gas & Electric, and Southern California Edison, zip code level information is insufficient to conduct intelligent service planning:

Knowing a charging location's ZIP code or city block will help with long-term capital planning, but does not provide utility personnel with the information they need to conduct local service planning assessments and execute upgrades where necessary.⁶

Electric vehicle customer addresses are needed to verify there is sufficient capacity within neighborhood distribution equipment, such as transformers. Intelligent

⁶ Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, *Joint-IOU Assessment Report For PEV Notification*, December 23, 2011, p. 25.

service planning can reduce the costs of integrating vehicle load. The cost of a typical transformer upgrade done on an emergency basis can be twice the cost of planned maintenance.⁷ Address-level information is also necessary to inform customers with PEVs as to savings available from time-of-use rates or other programs meant to integrate PEV load in the most cost-effective manner possible.

By and large, residential customers will not self-identify unless prompted, despite the fact most utility terms of service obligate them to notify their utility whenever they add significant new loads. Utilities should proactively reach out to customers with PEVs to inform them of savings available from a switch to effective time-of-use rates. For example, rather than solely relying on customers to find and use online bill calculators, utilities should send customers with PEVs individual estimates based on actual consumption data of savings that would be available from a switch to time-of-use rates.

Utilities should pursue a comprehensive approach to ensure adequate notification. Automaker databases, charging service providers, and local building permit offices are potential sources to provide utilities with the necessary information. However, the vehicle registration database maintained by the Department of Motor Vehicles is the most comprehensive resource, covering both new and used vehicle sales. The Commission should work with the utilities under its jurisdiction and the Department of Motor Vehicles to determine if notification can be provided under the current statutory framework. If it cannot, legislative or regulatory changes similar to provisions contained in California Senate Bill 859 (Padilla, 2011), which permitted utility access to vehicle registration data for purposes of service planning, may be needed.

⁷ *Id.* at 27.

b) What customer privacy concerns need to be addressed?

Customer data should be securely kept and necessary safeguards should be put in place. However, the Commission (and where necessary the legislature) must strike a balance between securing customer information and providing utilities with the ability to conduct necessary service planning and targeted customer education and outreach. In the view of some, amendments to California Senate Bill 859 meant to protect customer privacy were so restrictive that utilities may not be able to take advantage of vehicle registration data to conduct service planning.

c) If distribution facility upgrades are necessary to accommodate PEV charging, should such costs be shared among all customers (i.e., rate-based), or allocated in some other way?

NRDC and Pace recommend that the Commission focus its efforts on ensuring that there are benefits to be socialized, and not costs. Accordingly, the Commission should adopt policies that promote price transparency and time-variant rates for all end-users, off-peak charging, charging at lower voltages, and intelligent load management.

The Commission should maintain existing cost allocation principles and avoid attempts to track and allocate costs associated with PEV integration to PEV users exclusively. No such load discrimination was practiced when comparably demanding loads, including hot tubs and air conditioners, which lack the environmental benefits associated with PEVs, were integrated into the electrical grid. There is no rationale for attempting such load discrimination now. Furthermore, doing so presents questions of causation that simply cannot be answered. Asserting that a given PEV “caused” a transformer upgrade ignores all previously added loads which brought the transformer to the point of exceeding its capacity. Nevertheless, the impossibility of answering the cost-causation question for shared distribution assets should not prevent the Commission from directing utilities to conduct load research to ensure the most efficient integration of

vehicle charging. In sum, costs that would normally be socialized should continue to be socialized and costs that would normally be allocated to individual customers should continue to be recovered accordingly. Attempting to do otherwise is indefensible and could undermine the Commission's efforts to reduce barriers to the widespread and successful integration of electric vehicles.

d) At what level of PEV use would there be transmission level performance impacts? Are there any strategies that could minimize such impacts?

The precise level of PEV adoption at which transmission performance impacts could be felt is unclear, but it is not likely to occur in the immediate future and, in any case, if the Commission is successful in mitigating impacts to the distribution system by encouraging lower power, off-peak charging, the transmission system will likely be unaffected, even at high levels of PEV penetration. Accordingly, the Commission should focus its efforts on securing comprehensive and actionable utility notification, developing attractive time-of-use rates that encourage off-peak charging, and load management strategies that can accommodate higher power charging without incurring unnecessary costs. The same strategies that are important to minimize distribution level impacts can be used to prevent increases in system peak demand that could stress the transmission system.

In developing strategies to minimize adverse impacts to the distribution system, the Commission should not conceive of the PEV market in monolithic terms, as there are significant differences between power requirements by vehicle type and model. Lower powered charging (120V "Level 1" charging at 1.2-1.4kW or 240V "Level 2" charging at 3.3kW) can be integrated with minimal system impacts. Between June 2011 and October 2012, a period of time during which PEVs (both pure battery electric and plug-in hybrid electric) were generally not capable of charging at power levels higher than 3.3kW, California's investor-owned utilities conducted 6,306 infrastructure checks for electric

vehicle customers, but only found 22 instances in which service upgrades were deemed necessary to accommodate the addition of PEV load.⁸ Plug-in hybrid vehicles can generally be fully recharged overnight using “Level 1” equipment on standard 120 volt outlets at 1.2-1.4 kW, akin to a common toaster.

However, the power requirements associated with pure battery electric vehicles are likely to increase significantly. Many pure battery electric vehicle models available today are capable of charging at 6.6 kW or significantly higher and automakers are increasingly pointing to faster charging as a selling point. The distribution system impacts of integrating widespread high-powered charging are likely to be much greater than those associated with integrating lower-power Level 2 (3.3kW) and Level 1 charging.

A robust demand response program to provide service planners certainty high power residential charging will not coincide with peak demand is likely necessary to prevent avoidable distribution system upgrades. The *Joint IOU Electric Vehicle Load Research Final Report* cited above concludes that, because customers are responding to time-of-use PEV rates, and charging largely during off-peak periods, PEV load provides “a diversity benefit.”⁹ Because it occurs during off-peak hours when there is sufficient capacity in the system, it improves asset utilization and does not exacerbate system-wide peaks. However, the report also notes that “at the most local level service assessment level perspective (i.e., a single household or set of households serviced by a single

⁸ Pacific Gas & Electric, San Diego Gas & Electric, Southern California Edison, *Joint IOU Electric Vehicle Load Research Final Report*, Filed on December 28, 2102, p. 3: “It is important to note that the behavior of the early adopters of PEVs during this time period may not be representative of the average customer. In addition, the charging level of the vehicles during the study period may not necessarily be representative of the PEVs in the market today.”

⁹ *Joint IOU Electric Vehicle Load Research Final Report*, Filed on December 28, 2102, p. 23.

transformer), the value of this diversity is limited by the fact that the distribution system *must still be prepared to accommodate PEV charging during the peak period* since these customers can, and occasionally do, charge during those times (emphasis added).¹⁰ In other words, under current service planning protocols and in the absence of a comprehensive demand management program, when PEV charging actually occurs may have little bearing on distribution system costs. Because planners assume vehicles charge during peak hours, it may not matter when they actually charge. One of the single-most important factors driving overall system costs for consumers is projected peak demand. As noted above, NRDC and Pace expect automakers will continue to compete to provide faster re-fueling times for pure battery electric vehicles with higher powered chargers. This could have a significant impact on the number of distribution system upgrades that would be deemed necessary under current planning protocols. Again, it may not matter if a customer with a vehicle capable of charging at 6.6kW or higher almost never charges during peak hours, if the utility plans for the worst case scenario. In other words, without a comprehensive and reliable load management program, even if we realize the dream of off-peak charging that does not stress distribution system equipment, we may pay for the nightmare of widespread distribution system upgrades.

NRDC and Pace understand the automaker desire to meet the consumer demand for faster charging, and believe drivers should have the ability to charge more quickly when necessary. However, the vast majority of driving needs can be met with overnight charging at power levels of 3.3kW or lower. Likewise, NRDC and Pace understand the rationale for current system planning protocols that are necessary to meet reliability obligations. Utilities should work with automakers and the Commission, as well as the

¹⁰ *Id.*

New York Independent System Operator (NYISO) to explore how evolving PEV charging options and customer behavior can be effectively integrated into the states broader demand response programs. Doing so would provide system planners with sufficient certainty that the worst-case scenario will not come to pass and reward drivers for charging at lower levels of power. Without such a coordinated approach, the aggregate costs of integrating vehicles capable of charging at high levels of power could undermine the cost-effectiveness of widespread vehicle electrification.

The Commission should also note that the “diversity benefit” described above provided by PEV load is reliant upon charging that takes place in response to the price signals delivered by time-of-use rates. Without attractive time-of-use rates designed with PEV load in mind, the majority of customers will continue to take service on standard residential rates, exacerbating future distribution system impacts.

e) To what extent can the State’s solar photovoltaic (PV) policies, under the NY Sun initiative, be utilized to offset potential increases in peak demand that may result from the expanded use of EVCE, particularly at publicly available charging stations?

The NY Sun Initiative aims to scale the deployment of solar PV with funding directed toward projects at the residential-, commercial- (i.e., “distributed”) and utility-scale. On-site commercial-scale solar PV projects would likely represent the best fit project size category for publicly-available charging stations. To date, NYSERDA has already received some proposals from developers for installations on private commercial scale carports, illustrating the growing interest in projects of this nature. The Commission should consider how to potentially leverage NY Sun incentives and any available state or federal incentives to promote integration at charging stations. Furthermore, a pilot demonstration program could seek proposals that successfully combine publicly available PEV charging stations with innovative real-time energy

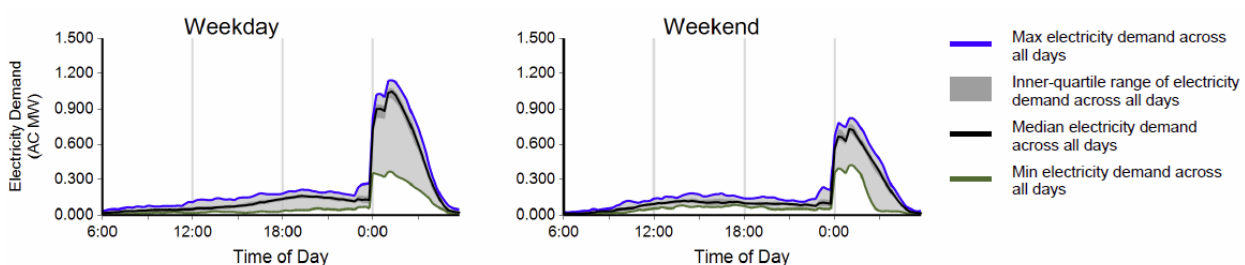
monitoring and management systems and on-site or within the same low-voltage distribution grid network distributed solar PV generation.

Utility Metering and Rate Issues

7. *How should the Commission exercise its regulatory authority to ensure that PEV charging, both at Charging Stations and in private locations, occurs in a manner that is consistent with grid capabilities, e.g., through time of use (TOU) or other rate structures?*

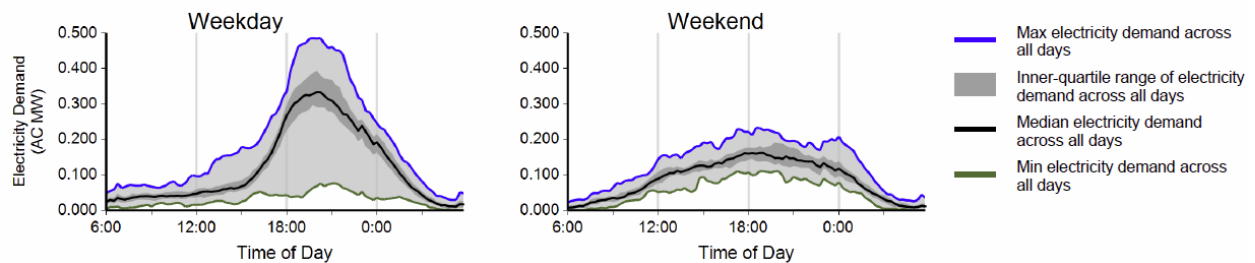
Shifting PEV charging load to off-peak hours can be accomplished with a combination of price signals, customer education and outreach, and the use of relatively simple scheduling functionality included in today's plug-in vehicles. This combination has proved effective in San Diego Gas & Electric territory. The utility's PEV tariffs have both "off-peak" and "super-off-peak" time periods, meant to encourage charging during the five "super-off-peak" hours when grid assets are the most under-utilized while also accommodating lower-power "Level 1" charging (which generally requires more than five hours to completely recharge a fully depleted battery) during off-peak hours. Figure 1 reflects the charging pattern of a customer group predominately composed of Nissan Leaf drivers in the San Diego region who received free "Level 2" charging equipment that allows them to generally meet their charging needs during the five hour super-off-peak period on San Diego Gas & Electric's PEV tariffs. Combined with extensive education and outreach, San Diego Gas & Electric has pushed almost all vehicle load in the service territory to off-peak hours; as shown in Figure 1, customers appear to be programing their cars to begin charging at midnight.

Figure 1: Residential PEV Load in San Diego, CA (1,187 Vehicles)¹¹



However, in service territories that lack this combination of attractive time-of-use rates and active customer education and outreach, charging generally occurs during on-peak evening hours. For example, customers in Nashville, Tennessee, appear to be simply charging upon returning home in the evening, often during hours that coincide with peak demand.

Figure 2: Residential PEV Load in Nashville Metro Area (407 Vehicles)¹²



Without an attractive time-of-use rate option and active customer education and outreach, EV charging in New York is likely to follow the pattern exhibited in Nashville rather than San Diego.

8. *Do existing rate structures need to be modified to accommodate the evolution of the PEV market? Are additional measures needed to increase the use of TOU rates for EVCE?*

Yes. As noted above, time-of-use price signals are critical to shift vehicle charging to off-peak hours. Unfortunately, existing time-of-use rates in New York may not be attractive to PEV customers. While Consolidated Edison recently proposed a time-of-use rate intended to encourage off-peak vehicle charging, NRDC estimates the proposed rate will not provide residential customers with net bill savings compared to the standard residential rate, unless they shift at least a quarter of non-PEV load to off-peak

¹² *Id.*

hours.^{13,14} In other words, the rate is not cost-neutral with the standard residential rate and will not be attractive to the majority of PEV customers.

A time-of-use rate should be structured such that, on average, it collects the same amount of revenue from the average non-PEV customer as the average non-PEV customer pays on the standard rate. On the time-of-use rate, the average customer pays more during on-peak hours and less during off-peak hours, but the average rate and total bill should be the same as it would be for the average customer on a standard rate, without any load shifting, or the utility will over or under-collect. Accordingly, an average customer who adds a PEV and charges during off-peak hours should have a lower bill on a time-of-use tariff than on a standard tariff, *without shifting any non-EV load*, because the additional load is billed at a rate that is lower than the average rate of the standard tariff. However, NRDC's calculations show that under the proposed rate, an average PEV customer charging during off-peak hours would pay more on the time-of-use rate than on the standard residential rate. In other words, the average customer has no economic incentive to choose a time-of-use rate after purchasing an electric vehicle. This will undermine the Commission's efforts to minimize distribution system impacts by shifting load to off-peak hours, and undermine the economics of vehicle electrification in New York by eroding savings relative to conventional fuels.

¹³ See NY PSC Case 13-E-0030, Consolidated Edison Filing Letter, Service Classification 1, Rate III, p. 77, <http://www.coned.com/documents/2013-rate-filings/filing-letter-and-attachments.pdf>.

¹⁴ See Natural Resources Defense Council, *Direct Testimony of Luke Tonachel on behalf of the Natural Resources Defense Council*, CASE 13-E-0030 - Proceeding on Motion of the Commission as to the Rates, Charges, Rules and Regulations of Consolidated Edison Company of New York, Inc. for Electric Service, p. 3, <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={326F56AA-BDE2-4278-9D8A-6822643567A4}>.

The PSC should ensure that utilities offer attractive time-of-use rates with off-peak charging periods of at least 10 hours. This will allow charging at lower power levels (using “Level 1” equipment), which will minimize adverse impacts to the distribution system and allow drivers of plug-in hybrid vehicles to avoid the purchase of potentially expensive charging equipment while still maximizing savings relative to gasoline.

9. *What additional metering policies or protocols (e.g., dual metering, submetering) may be needed to accommodate various EVCE options?*

Ensuring utilities offer “whole-home” time-of-use tariffs that are attractive to the average customer, as recommended immediately above, is necessary, but not sufficient to shift PEV charging to off-peak hours and maximize savings relative to conventional fuels. Properly designed “whole-home” time-of-use rates should be attractive to a customer with an average level of consumption and average load profile considering a PEV purchase, but they may not be attractive to today’s typical PEV customer, who generally lives in a single-family home with a higher-than average level of consumption in New York. For those customers, the benefit of charging during off-peak hours is likely to be off-set by the increased costs associated with exposing greater-than-average amounts of non-PEV load to higher on-peak prices. Even some customers with average or lower-than average monthly consumption may not find whole-home time-of-use rates attractive, especially those who work at home. Without an attractive time-of-use option, such customers will continue to take service on standard rates that do not provide sufficient savings relative to gasoline and fail to encourage off-peak charging.

Dedicated metering enables PEV-specific time-of-use rates that ensure all customers, regardless of their non-PEV consumption levels or patterns, have an opportunity to maximize savings relative to conventional fuels and an incentive to charge during off-peak hours. The price of gasoline does not vary depending on other energy

decisions made by consumers; it is the same for every customer. The price of electricity as a transportation fuel should be similarly transparent and accessible.

Although Consolidated Edison recently proposed to provide customers with an option to charge PEVs using a second meter billed according to a commercial rate, the high monthly customer charge and the expense associated with the installation of a second meter under the standard configuration render this option unattractive to the vast majority of EV customers.¹⁵ Consolidated Edison's sub-metering pilot may be a more attractive option. The pilot consists of an energy gateway paired with an energy measuring device that is capable of separately measuring PEV energy consumption (as opposed to whole house energy consumption). Information is communicated to a data center that customers can access to set up PEV charging profiles and monitor PEV real-time energy usage. Consolidated Edison estimates that this technology could cost half as much as hiring an electrician to install a separate meter and will involve a lower monthly fee than a second meter. The Commission should examine Consolidated Edison's pilot, as well as other sub-metering and dual metering scenarios, to determine lowest-cost options for PEV customers.

Consumer Issues

10. What risks face consumers in the market for EV charging services and how does, or should the market or other entities address those risks?

Consumers wishing to adopt plug-in electric vehicles confront the uncertainty of when their investment in vehicle technology will be paid off due to lower operating expenses. The Commission, through its regulation of utility rate structures and other authorities, can play an important role in reducing that consumer risk by making the price

¹⁵ See *Id.* at 4.

of a electricity as a transportation fuel transparent, ensuring savings relative to conventional fuel are clear. The Commission could instruct the utilities under its jurisdiction to display the price of electricity under various rate options in dollar-per-gallon-equivalent terms, as the Department of Energy has done with its recently released “eGallon” to allow consumers the opportunity to make a direct comparison between fuels.¹⁶

Likewise, by making time-of-use rates available that provide consumers an incentive to charge during off-peak hours and the opportunity to take advantage of the lower cost-of-service during such hours, the Commission can maximize electric vehicle operating cost savings relative to gasoline or diesel and can sharply reduce electric vehicle consumer pay-back. Also, by establishing general principles for rate structures across the state, consumers gain assurance that their electric vehicle purchase will still be highly cost-effective even if they switch to another utility service provider.

Consistency and interoperability should also be encouraged across electric vehicle charging service providers. The ability to charge electric vehicles at public-accessible charging stations across the state will enhance electric vehicle usability and make them more attractive. As noted above, the Commission should explicitly outline the sources of authority, other than direct utility regulation, upon which it will rely to ensure fairness of use of public charging stations while it also optimizes environmental benefits and the efficiency of the electrical grid.

¹⁶ <http://energy.gov/maps/egallon>

11. To what extent should outreach efforts integrate PEV and solar PV information?

Electrification of transportation presents a singular opportunity to raise the energy awareness of consumers in the electricity sector. Almost half of respondents in an international study conducted by Accenture reported that knowing electric vehicles were charged with renewable electricity would encourage them to buy one.¹⁷ Researchers from Simon Fraser University and the University of California at Davis found that combining “green energy” with PEVs caused conventional car buyers participating in a design exercise to purchase PEVs 23 percent more frequently.¹⁸ Likewise, sixty-seven percent of participants in a yearlong study conducted by the University of California at Davis and BMW reported that driving an electric version of the Mini Cooper changed the way they think about energy.¹⁹ Many participants installed solar panels, and undertook building energy efficient upgrades. NRDC and Pace reiterate the recommendation for a pilot program to meet this consumer demand, as described in the response to question 6(e). More generally, NRDC and Pace recommend the Commission pursue five pathways to accelerate the adoption of both clean energy and electric vehicles:

On-Site Energy Efficiency Upgrades

Energy efficiency is generally the lowest cost resource to offset increased electricity usage from PEV charging, and results in zero emissions. Driving a PEV can increase typical household electricity consumption by about a third, an amount that can generally be completely offset using readily available residential efficiency upgrades,

¹⁷ Accenture, [*Plug-in Electric Vehicles Changing Perceptions, Hedging Bets*](#), 2011, p. 16.

¹⁸ K.S. Kurani, J. Axsen, N. Caperello, K. Bedir, and J. Tyree Hagerman, *Consumers, Plug-in Electric Vehicles, and Green Electricity*, presented at “Plug-in Electric Vehicles and Clean Energy in California,” Sacramento, California, October 24, 2012.

¹⁹ UC Davis Institute of Transportation Studies Research Report: *UCD-ITS-RR-11-05*, p. 71.

including lighting, heating, cooling, and building envelope improvements.²⁰ The increased energy awareness that results from the use of electricity as a transportation fuel can drive cost-effective energy efficiency, further improving the economics of vehicle electrification, while existing energy efficiency programs could provide a platform to educate interested customers as to the benefits of PEVs. Coordinating these efforts would help New York meet its long-term environmental goals. As the Commission embarks on its comprehensive clean energy program review this year, opportunities to leverage outreach and marketing around efficiency and renewable energy offerings to include PEV information should be considered.

On-Site Renewable Energy

On-site renewable electricity provides a tangible connection between vehicle charging and clean energy. Nearly 40 percent of the first wave of PEV drivers in California own rooftop solar systems, and an additional 17 percent report an intention to install solar within a year.²¹ The NY Sun initiative should target potential PEV customers as they are likely participants and should educate customers interested in solar as to the benefits of vehicle electrification.

²⁰ The average U.S. household uses 11,500 kilowatt-hours per year (Energy Information Agency, [Table 5.A: Residential Average Monthly Bill by Census Division, and State 2010](#).) A PEV with an efficiency of 0.33 kilowatt-hours per mile driven 10,000 miles per year would increase the average home consumption by less than a third, an amount that can be offset using readily available technologies (Rich Brown, Sam Borgeson, Jon Koomey, and Peter Biermayer, [U.S. Building-Sector Energy Efficiency Potential](#), September, 2008, Table 2.) For reference, current Nissan Leaf drivers are averaging approximately 7,900 miles per year. (See Ecotality, [EV Project Quarterly Report, Second Quarter](#), 2012. Note: estimation assumes linear vehicle adoption throughout quarter in question.) Of course, PEV utility is expected to increase as technology improves and more charging infrastructure is deployed. Electric mileage for plug-in hybrid drivers will also depend on individual driving patterns. For reference, according to [Chevy's "On-Star" data](#), Volts are being driven 62% on electricity.

²¹ California Center for Sustainable Energy, [California PEV Owner Survey](#), August, 2012, p. 9.

Off-Site Renewables

Some utilities offer customers the opportunity to contract directly with renewable energy providers or purchase shares in local renewable energy projects. The Sacramento Municipal Utility District's "Solar Shares" program allows customers to purchase a portion of the electricity generated by a local one-megawatt solar farm. San Diego Gas & Electric recently applied for approval from the California Public Utilities Commission for a "Share the Sun" program, which allows customers to contract directly with solar developers for electricity delivered by San Diego & Gas Electric. Such programs allow PEV drivers who would like to install on-site renewables, but who are unable to do so, a chance to provide tangible support for renewable generation. In the event that these programs become available in the near future, the Commission, NYSERDA and the utilities should consider targeting PEV drivers in outreach efforts, and developers could target customers in utility service territories with increasing numbers of PEV demand .

Green Tariffs

PEV drivers with access to utility or ESCO green pricing programs can already ensure that Renewable Energy Certificates are retired on their behalf sufficient to meet their household electricity consumption. Nationally, however, only around two percent of those utility customers who have the option to choose green pricing do so.²² Utilities and ESCOs wishing to expand green pricing programs could offer PEV-specific programs, or could leverage the increased energy awareness that accompanies vehicle electrification to

²² Lori Bird, Claire Kreycik, and Barry Friedman, [*Green Power Marketing in the United States: A Status Report \(11th Edition\)*](#), October, 2008, pp. 5-6.

increase participation in existing programs. Vehicle electrification could also encourage greater numbers of utilities to offer green pricing programs.

Facilitating the Integration of Variable Renewable Resources

PEVs offer the opportunity to facilitate the integration of large-scale renewables that do not necessarily coincide with peak demand, such as wind, which often peaks during the evening and nighttime hours when vehicles are most often charged.²³ Accordingly, the efforts described above meant to shift vehicle load to off-peak hours could provide additional benefits in terms of integrating off-peak wind generation. PEVs could potentially provide even larger grid benefits for renewables integration if charging times could be managed to match real-time renewable generation while still meeting customer needs. In 2009, BMW demonstrated this potential in a partnership with the European utility, Vattenfall, matching the charging needs of a MINI E fleet with intermittent wind energy.²⁴

III. Conclusion

NRDC and Pace commend the Commission for addressing issues that are vital to the electrification of the transportation sector. The policies adopted in this proceeding will have a significant impact on the fundamental economics of a decision to drive on electricity and could help accelerate the deployment of cleaner vehicles in New York.

²³ See Ecotality, [*EV Project Quarterly Report, Second Quarter*](#), 2012.

²⁴ Vattenfall AG, [*Klimaentlastung durch den Einsatz erneuerbarer Energien im Zusammenwirken mit emissionsfreien Elektrofahrzeugen*](#) (Climate Change Mitigation Through Usage of Renewable Energy Sources in Combination with Emission Free Electric Vehicles), March, 2011.